of gas, after which they were washed with hot sublimate solution, the focus of pus thoroughly washed out, and the abdominal wound closed, except at its inferior end, which was left open for drainage. The patient made an uninterrupted recovery. In conclusion the author states that an analysis of this case shows: (1) That perforation occurred at the twelfth or fifteenth day of the fever—that is to say, toward the end of the second week. (2) That the patient was not operated upon until three days after the perforation had occurred—that is to say, at the moment when the infection was general. The result in this case shows that even when the case seems perfectly hopeless it is, nevertheless, the duty of the surgeon to operate.

Note on the Value of Roux's Operation for the Radical Cure of Femoral Hernia.—RENTON (*British Medical Journal*, December 27, 1902) states that he has found this method satisfactory in the ten cases in which it was used. It consists in (1) making an incision over the crural canal; (2) isolation of the sac, putting a catgut ligature around its neck, and cutting it off; (3) a metal staple is passed obliquely through Poupart's ligament over the crural canal, taking care to avoid the femoral vein, and then it is gently hammered into the pubis; (4) stitching the skin incision. The author states that care must be taken not to put the staple in too tightly, which would injure Poupart's ligament; still, it must be sufficiently secured to prevent any recurrence of the hernia. The staple remains permanently in situ; it causes no irritation, and does not injure the bone. Roux has reported over sixty cases in which the retention of the staple has given rise to absolutely no trouble, and there has been no recurrence of the hernia.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD WEBB WILCOX, M.D., LL.D.,

PROFESSOR OF MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; VISITING PHYSICIAN TO ST. MARK'S HOSPITAL,

AND

SMITH ELY JELLIFFE, M.D., PH.D.,

PROFESSOR OF PHARMACOGNOSY AT THE COLLEGE OF PHARMACY; CLINICAL ASSISTANT AT THE VANDERBILT CLINIC (COLUMBIA UNIVERSITY), NEW YORK.

Toxicology of Adrenalin.—DR. TARAMASIO reports on the toxic doses of adrenalin for frogs, guinea-pigs, and rabbits. Adrenalin was first prepared in 1901 by Takamine, following closely on Abel's work on epinephrin. It is a staple yellow powder, slightly soluble in water, and easily soluble in water of alcohol if acidulated with acetic or hydrochloric acid, and is considered to be by Takamine a basic salt with formula $C_{10}H_{15}NO_3$, but by Aldrich is thought to be $C_9H_{13}NO_3$. This drug gives a green color with ferric chloride, and a standard dilution of adrenalin has been fixed at that strength which produces with a 15 per cent. solution of ferric chloride a green color only deep enough to last a few seconds, 1 c.c. of adrenalin solution so diluted, being called a ferric chloride unit. Thus one centigramme of the salt giving 700–750 ferric chloride units means that one centigramme dissolved in about 750 c.c. of water gives, with ferric chloride, a green tint which persists for ten seconds. Other preparations from suprarenal glands brought forward in previous years are: 1. Suprarenin, a red brown powder, which is a ferric compound introduced by Furth. 2. Epinephrin of Abel and Crawford, a benzol compound. 3. Sphygmogenine, a syrupy body, chemically indefinite, brought forward by Frankel. The second part of this report is taken up with the work of other men on the same subject. Many different animals have been used for experiment, but owing to different circumstances and the use of different preparations of the capsules it was impossible to gauge the dose of active substance which has toxic effects in each case. The author notes that Gourfein has said the toxic dose is very inconstant, but he finds but little variation in the fatal dose. In a general way, the results already arrived at are, that the blood pressure is greatly raised, the pulse is slowed, and respiration becomes more rapid and superficial. Pellicani is cited as the first to study the toxic action of suprarenal extract, thus finding that preparations from calves, oxen, and lambs are less toxic than those from carnivorous and smaller herbivorous animals; Oliver and Schäfer, as having rightly determined that vasoconstriction is due to a direct action on the smaller vessels, and is not of nervous origin, death being due, they considered, to bulbar paralysis, the respiratory centre being especially affected, and Cybulski (1896) as having brought forward pulmonary congestion as the direct cause of death. Finally, the work of Taramasio himself is given. He injected adrenalin dissolved in slightly acidulated water subcutaneously in the case of guinea-pigs and rabbits, and into the dorsal lymph sac in frogs. The following figures represent the dose of adrenalin injected per kilogramme of weight of the animal used for experiment:

	Dose never fatal.	Dose sometimes fatal.	Dose always fatal.
Frogs,	0.824 gram.	0.025 gram.	0.50 gram.
Guinea-pigs,	0.002 "	0.004 "	0.02 "
Rabbits,	0.002 "	0.004 "	0.01 "

Symptoms: dyspnœa, paresis with anæsthesia, and mydriasis in frogs appear a few minutes to an hour after injection, recovery, when it occurs, being complete within one, or at most, two days. Only six of the frogs treated with possible fatal doses died, though surroundings were unfavorable, the fact that pulmonary respiration is not necessary probably accounting for this slight toxicity, the skin taking on part of the functions of the lungs. Small doses cause slight increase of respiration in guinea-pigs, together with a slight fall of temperature, the prominence of the symptoms increasing in proportion to the dose. Sensation and motor power diminishing, death occurs generally within half an hour, and recovery, when occurring, being complete within a day. A blood-stained froth comes from the mouth and nose in the death agony, the heart continuing to beat after respiration has ceased. The lungs are found congested and covered with widespread ecchymoses, and acute œdema is the cause of death without doubt. The action of the drug on rabbits, he states, closely resembles that on guinea-pigs; subcutaneous injection in both causing a slight slough, with a resulting scar, which is probably due to local anæmia, caused by contraction of the muscle walls of small arteries, for the anæmia itself prevents a rapid absorption from the point of injection. The author agrees with those who think pulmonary œdema causes death rather than with those who consider it a result of paralysis of the nervous system, though the latter action may be present to some degree in mammals, it plays a minor part. In frogs, on the other hand, the paralysis of the nervous system is thought to be the cause.—*Revue medicale de la Suisse Romande*, 1902, vol. xxii. p. 589.

Anæsthesin.—DR. CHEVALIER reports on a new product, first discovered by Ritsert in 1890, but abandoned by him until recently, when Van Noorden, Dunbar, Lengemann and others have used it extensively, with excellent results. It is an ethylic ether of paramidobenzoic acid, and exists as a white powder without taste or odor; soluble with difficulty in 800 parts of water, but freely soluble in alcohol, ether, chloroform, acetone, fats, and oils. It is particularly adaptable in fatty combinations. Its dangers, if any, are due to its property of causing fixation of oxygen and the formation of methæmoglobinuria; but this takes place, according to Binz, in enormous doses only. Therapeutically it has been used with good results in ulcer of the stomach, gastric hyperæsthesia, in doses of thirty grains daily. In gastric irritability, doses of three to four grains prove efficient. In hyperæsthesia of the larynx it is used to advantage as a spray or as an inhalant, a 10 per cent. solution being used, oily or alcoholic. As a suppository in three to five-grain doses it is efficient in hemorrhoids. In a 10 per cent. lanoline ointment it has proven of inestimable service in a diabetic. Anæsthesin hydrochlorate may be employed hypodermically in 4 per cent. solution as an efficient local analgesic. Toxic or irritating effects have not been described.—*Revue de Therapeutique*, 1902, vol. lxix. p. 834.

The Active Principles of Rhubarb.—DRS. A. TSCHIRCH and HENBERGER have restudied the question of the composition of rhubarb. Among the active principles they distinguish two groups of glycosides, tannoglycosides derived from rheotannic acid and anthraglycosides or anthracene glycosides. These pre-exist in the plant and are accompanied by a number of diverse products difficult to separate. The tannoglycosides are formed by the action of a left rotary sugar and of tannin (rhubarb red). The anthraglycosides are formed of the right rotary sugar and of different derivations of anthracene. Among these they mention chrysophanic acid, dioxymethylanthraquinone and trioxymethylanthraquinone, emodine, and rheine, which Tschirch thinks is a methyl ether of a tetramethylanthraquinone. All of these bodies are purgative.—*Pharmaceutische Zeitung*, 1902, vol. xviii. p. 547.

Treatment of Sydenham's Chorea by Arsenic.—DR. P. TIMACHEFF has made a careful analysis of arsenical therapy in twenty-six cases of chorea treated by arsenic in different combinations. In eight cases he used Fowler's solution, in six, Levico (an arsenical) water, in twelve he used an aqueous solution of arsenous acid after Comby's method. He preferred the last, both